

The steps in producing a protein

Step 1 Transcription

During transcription, RNA polymerase binds to DNA and separates the DNA strands. - this occurs in the nucleus

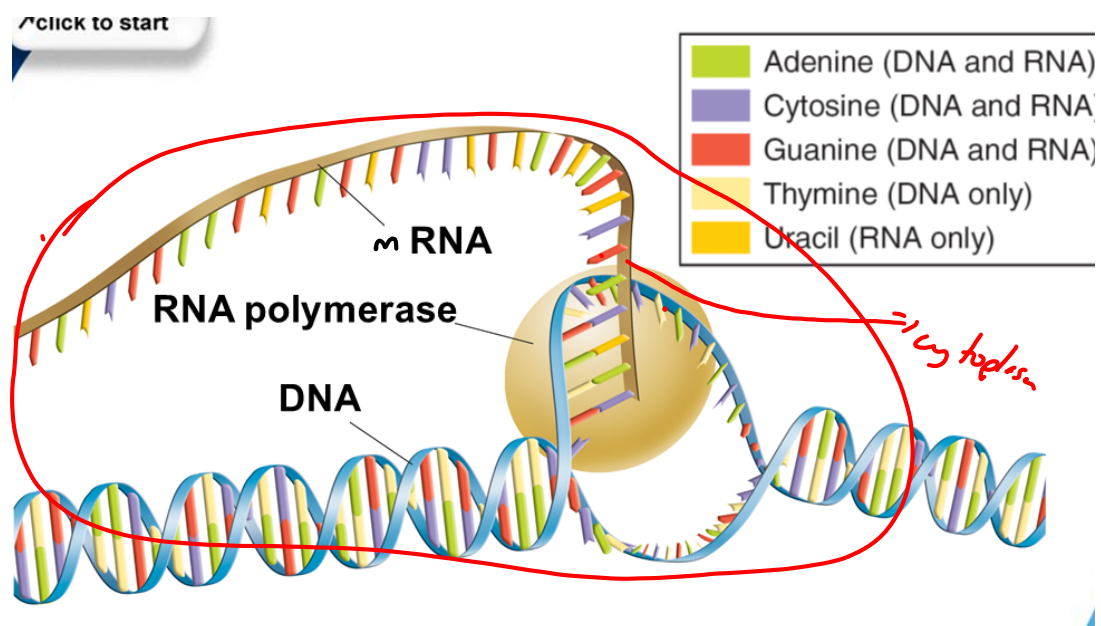
RNA polymerase then uses one strand of DNA as a template from which nucleotides are assembled into a strand of RNA. (called mRNA)

Unzip a small section of DNA (gene)

RNA polymerase binds only to regions of DNA known as promoters.

site
Promoters are signals in DNA that indicate to the enzyme (RNA polymerase) where to bind to make RNA.

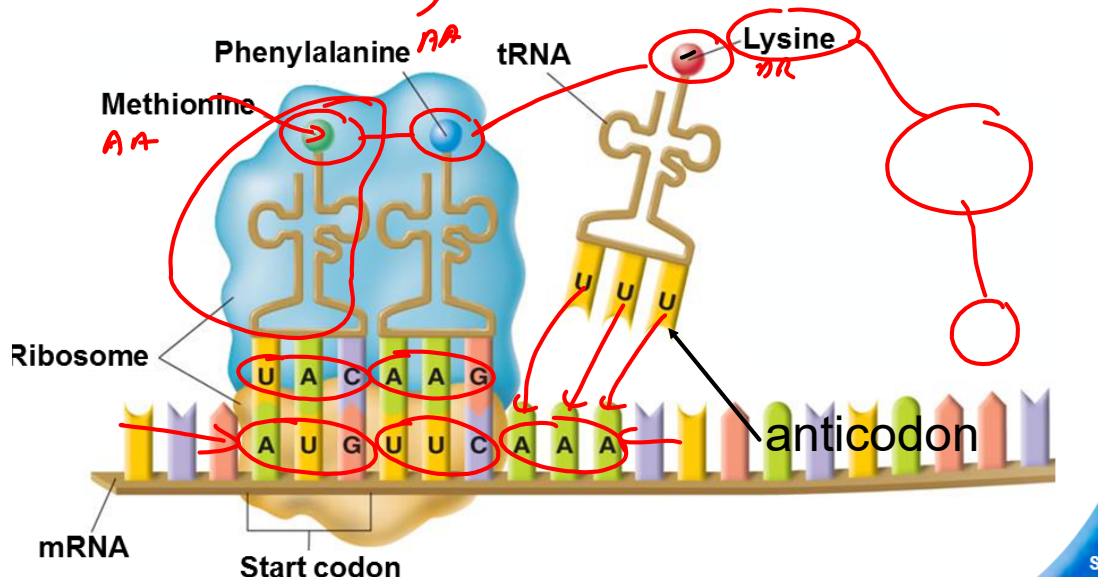
- mRNA detaches from the DNA strand & heads to the cytoplasm to its message
- DNA zips back up



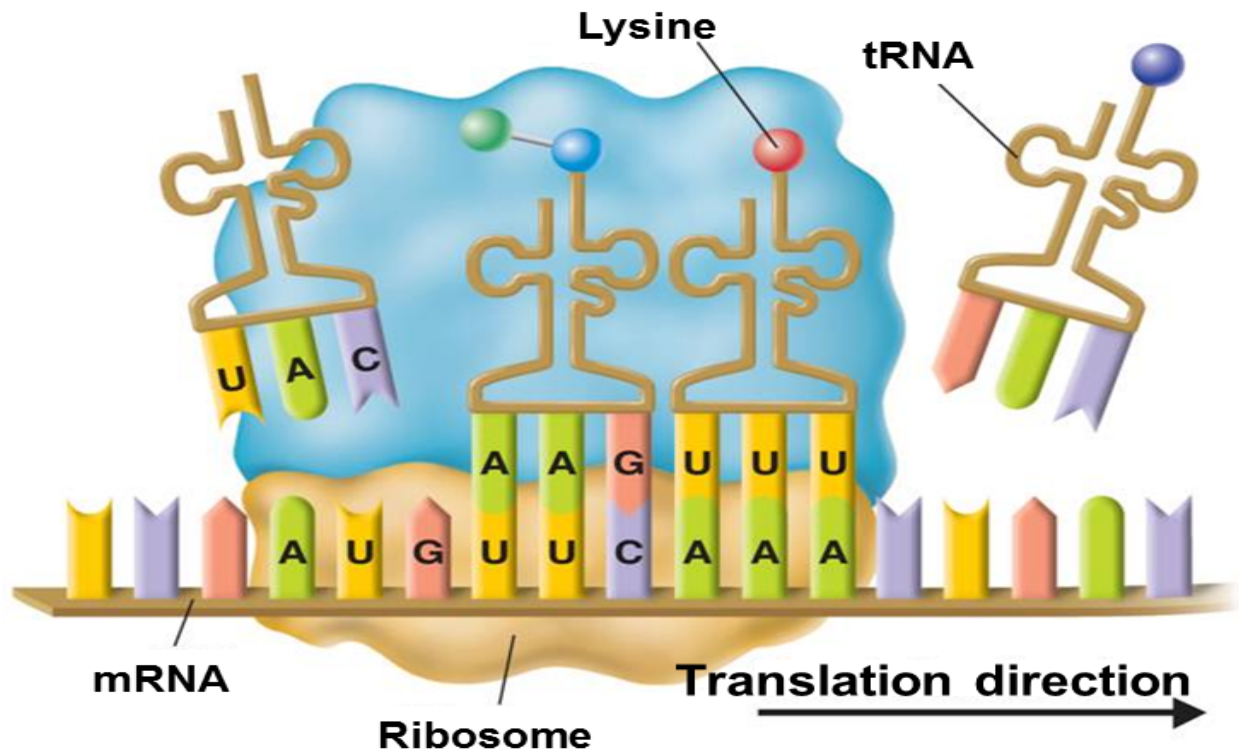
Step 2 Translation

- involves the decoding of the information on the mRNA molecule (*moves out of nucleus through a nuclear pore.*)
- occurs in the cytoplasm - mRNA attaches to a ribosome - message is translated (decoded)
- tRNA delivers the proper amino acid (based on the codon) to the ribosome
- rRNA - link the amino acids in the proper order

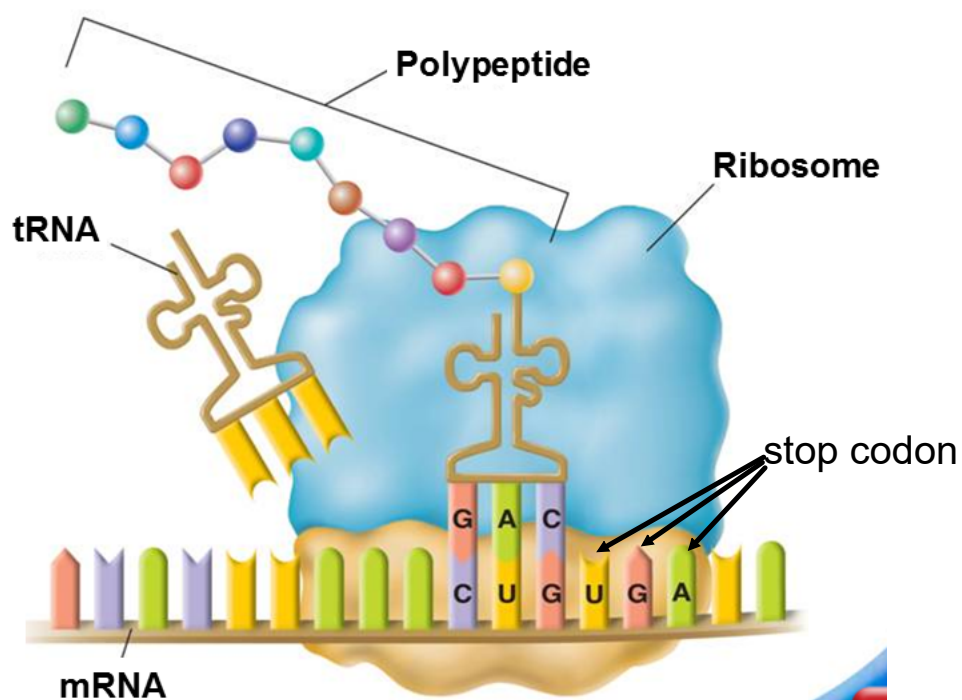
~~The ribosome binds new tRNA molecules and amino acids as it moves along the mRNA.~~



- as more amino acids are added - peptide bonds form between them (*polypeptide*)
- eventually this chain of amino acids form a protein

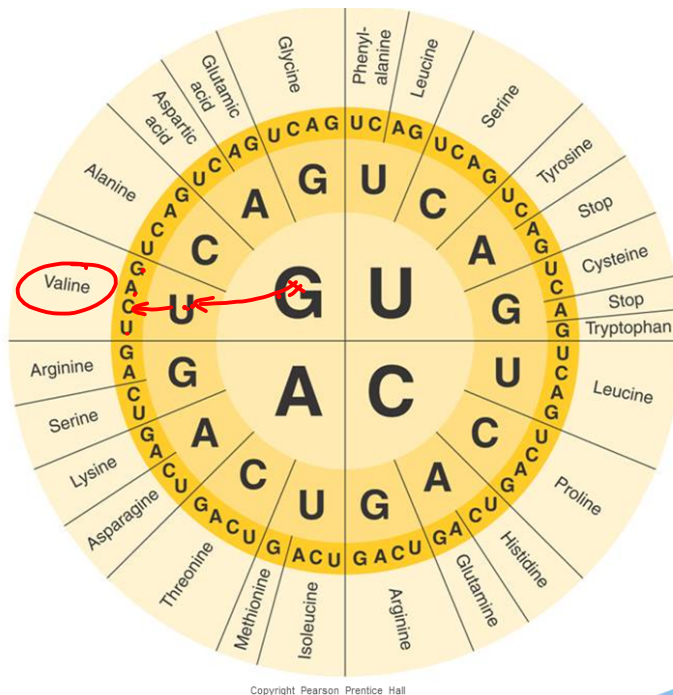


- this process will continue until it reaches a stop codon (UGA UAA UAG)



Lesson 4B Protein Synthesis continued.notebook

The chart below is used to find the amino acids from the given codon from mRNA



GUC

Ex. you start with a DNA strand

TAC CGA AAT GGA TCG

This coded by mRNA into

AUG GCU UUA CCU ACG

* Remember U replaces T!!!!

Using the wheel the codon from mRNA are translated into amino acids (start from the inside and work your way out).

AUG - start codon

GCU - Alanine

UUA - Leucine

CCU - Proline

ACG - Threonine

These 4 amino acids will be bonded together to form a protein

1. Find the amino acids represented by the following DNA strand

DNA Strand TAC ACC ATC CCG TAA GAC

mRNA - AUG UGG UAG GGC AUU CUG

amino acids - Meth. — Trp. — Stop


2. Find the amino acids for this strand

DNA strand - TAC CCA TTA CGC TCG TTC ACC GGT AGC

mRNA Strand -

Amino acids -

Complete protein assignment

Read and summarize section 12-4

Mutations p 307- 308